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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/750,456

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J. Nelson Wright

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EXAMINER

WEATHERBY, ELLSWORTH

ART UNIT

PAPER NUMBER

3768

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/750,456	Applicant(s) WRIGHT ET AL.	
	Examiner ELLSWORTH WEATHERBY	Art Unit 3768	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 11 February 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-49 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-49 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 11 February 2008 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Drawings

1. The drawings were received on 2/11/08. These drawings are acceptable.

Claim Objections

2. Claims 1-49 are objected to because of the following informalities: Regarding claims 1, 12, 21, 29, 38 and 42, Applicant claims applying an excitation to at least one of the sensing elements, but then claims repeating the excitation for each of the sensing elements. These two steps are not in agreement with one another. Regarding claims 2, 13, 22, and 43, a structural limitation, "preamplifier", is set forth. However, the claims fail to set forth a further step in the method. Regarding claim 6, "the sense coils" lacks antecedent basis. Regarding claims 31 and 37, these claims appear to be directed to the use of the apparatus and do not set forth a further structural limitation. Further regarding claim 37, "the calibrating method" lacks antecedent basis. Regarding claim 38, "the sensing array" at line two should be *each sensing array*. Appropriate correction is required.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the

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applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. Claims 1,3,6,8,12,14,21,23,29,31,42,44 and 47 are rejected under 35

U.S.C. 102(e) as being anticipated by Anderson et al. (USPN 7,158,754).

5. Anderson et al. 754 (hereinafter Anderson) teaches calibrating a sensor array, the sensor array including a plurality of sensing elements (col. 3, ll. 33-40), The method comprising: applying an excitation current to at least one but less than all of the plurality of sensing elements of the sensing array used for marker localization (col. 4, ll. 46-59; col. 10, ll. 35-46); analyzing the output of some or all of the plurality of sensing elements resulting from the excitation (col. 10, ll. 35-60); repeating the excitation and analyzing process for each of the plurality of sensing elements (col. 10, ll. 35-60); and determining corrections to a sensed signal based upon the output of the plurality of sensing elements during marker localization (col. 11, l. 62- col. 12, l. 3). Anderson also teaches a calibration subset (col. 3, ll. 33-40).

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of

the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

8. Claims 2,4,5,13,15,16,22,24,26,30,32,33,43 and 45 are rejected under 35 U.S.C. 103(a) as being unpatentable over Anderson et al. (USPN 7,158,754) in view of Amorai-Moriya (USPN 6,487,516).

9. Anderson teaches all the limitations of the claimed invention including teaching an excitation current (col. 4, ll. 46-59; col. 10, ll. 35-46). However, Anderson does not expressly teach a preamplifier or a differential amplifier associated with each sensor.

10. In a similar field of endeavor, Amorai-Moriya teaches providing each sensor of a sensing array with a differential amplifier having first and second amplification elements, wherein an induced excitation voltage is applied sequentially to the first and second amplification elements (col. 18, ll. 44-65).

11. It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Anderson in view of Amorai-Moriya. The motivation to modify Anderson in view of Amorai-Moriya would have been to provide lower noise operation. Furthermore, the number of amplification elements within the differential amplifier is an obvious design choice and is not given patentable weight since it has been held that

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mere duplication of the essential working parts of a device involves only routine skill in the art. *St. Regis Paper co. v. Bemis Co.*, 193 USPQ 8.

12. Claims 7,9,17,25 and 34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Anderson et al. (USPN 7,158,754) in view of Goldfine et al. (Pub. No.: 2004/0021461).

13. Anderson teaches all the limitations of the claimed invention except for expressly teaching that the excitation is a voltage to the sensing element.

14. Goldfine et al. (hereinafter Goldfine) teaches a sinusoidal voltage driver for driving a source coil in a sensor array [0129-0130].

15. It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Anderson in view of Goldfine. The motivation to modify Anderson in view of Goldfine would have been to drive the sensors using a voltage, as taught by Goldfine.

16. Claims 10,11,18,20,28,35,37,46 and 49 are rejected under 35 U.S.C. 103(a) as being unpatentable over Anderson et al. (USPN 7,158,754) in view of Govari et al. (USPN 6,177,792).

17. Anderson teaches all the limitations of the claimed invention except for expressly teaching that the excitation current is a sinusoidal wave. Anderson also does not expressly teach that the calibrating method is interleaved between marker localization operations.

18. In a similar field of endeavor Govari et al. (hereinafter Govari) teaches mutual induction correction for radiator coils of an objects tracking system (abstract). Govari goes on, teaching driving the coils with sinusoidal currents (col. 7, ll. 42-47). Govari also that a calibrating method is interleaved between marker localization operations (col. 3, ll. 10-23).

19. It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Anderson in view of Govari. The motivation to modify Anderson in view of Govari would have been to enable simple corrected magnetic field calculations resulting from the driver circuits associated with each coil, as taught by Govari (col. 7, ll. 43-60).

20. Claims 19, 27, 36 and 48 are rejected under 35 U.S.C. 103(a) as being unpatentable over Anderson et al. (USPN 7,158,754) in view of Dumoulin (USPN 6,201,987).

21. Anderson teaches all the limitations of the claimed invention except for expressly teaching that an excitation is applied to more than one of the plurality of sensing elements simultaneously.

22. In a similar field of endeavor, Dumoulin teaches error compensation for device tracking systems employing electromagnetic fields (abstract). Dumoulin goes on, teaching that an excitation is applied to more than one of the plurality of sensing elements simultaneously (col. 4, ll. 35-53).

23. It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Anderson in view of Dumoulin. The motivation to modify Anderson in view of Dumoulin would have been to track the direction and magnitude of the magnetic field at the location of the tracked probe, as taught by Dumoulin.

24. Claims 38 and 41 are rejected under 35 U.S.C. 103(a) as being unpatentable over Anderson et al. (USPN 7,158,754) in view of Dumoulin (USPN 6,201,987).

25. Anderson teaches calibrating a sensor array, the sensor array including a plurality of sensing elements (col. 3, ll. 33-40), The method comprising: applying an excitation current to at least one but less than all of the plurality of sensing elements of the sensing array used for marker localization (col. 4, ll. 46-59; col. 10, ll. 35-46); analyzing the output of some or all of the plurality of sensing elements resulting from the excitation (col. 10, ll. 35-60); repeating the excitation and analyzing process for each of the plurality of sensing elements (col. 10, ll. 35-60); and determining corrections to a sensed signal based upon the output of the plurality of sensing elements during marker localization (col. 11, l. 62- col. 12, l. 3). Anderson also teaches a calibration subset (col. 3, ll. 33-40).

26. Anderson does not expressly teach calibrating multiple sensing arrays. Anderson also does not expressly that an excitation is applied to more than one of the plurality of sensing elements simultaneously.

27. In a similar field of endeavor, Dumoulin teaches error compensation for device tracking systems employing electromagnetic fields (abstract). Dumoulin goes on,

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teaching that the error compensation can be used in multiple structures (col. 7, ll. 5-17).

Dumoulin also teaches that an excitation is applied to more than one of the plurality of sensing elements simultaneously (col. 4, ll. 35-53).

28. It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Anderson in view of Dumoulin. The motivation to modify Anderson in view of Dumoulin would have been to maintain consistency in calibration between multiple devices.

29. Claim 39 is rejected under 35 U.S.C. 103(a) as being unpatentable over Anderson et al. (USPN 7,158,754) in view of Dumoulin (USPN 6,201,987) as applied to claim 38 above, and further in view of Goldfine et al. (Pub. No.:2004/0021461).

30. Anderson in view of Dumoulin teaches all the limitations of the claimed invention except for expressly teaching that the excitation is a voltage to the sensing element.

31. Goldfine teaches a sinusoidal voltage driver for driving a source coil in a sensor array [0129-0130].

32. It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Anderson in view of Dumoulin with Goldfine. The motivation to modify Anderson in view of Dumoulin with Goldfine would have been to drive the sensors using a voltage, as taught by Goldfine.

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33. Claim 40 is rejected under 35 U.S.C. 103(a) as being unpatentable over Anderson et al. (USPN 7,158,754) in view of Dumoulin (USPN 6,201,987) as applied to claim 38 above, and further in view of Govari et al. (USPN 6,177,792).

34. Anderson in view of Dumoulin teaches all the limitations of the claimed invention except for expressly teaching that the excitation current is a sinusoidal wave. Anderson also does not expressly teach that the calibrating method is interleaved between marker localization operations.

35. In a similar field of endeavor Govari teaches mutual induction correction for radiator coils of an objects tracking system (abstract). Govari goes on, teaching driving the coils with sinusoidal currents (col. 7, ll. 42-47). Govari also that a calibrating method is interleaved between marker localization operations (col. 3, ll. 10-23).

36. It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Anderson in view of Dumoulin with Govari. The motivation to modify Anderson in view of Dumoulin with Govari would have been to enable simple corrected magnetic field calculations resulting from the driver circuits associated with each coil, as taught by Govari (col. 7, ll. 43-60).

Response to Arguments

37. Applicant's arguments with respect to claims 1-49 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ELLSWORTH WEATHERBY whose telephone number is (571) 272-2248. The examiner can normally be reached on M-F 8:30 a.m. - 5:00 p.m..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Brian Casler can be reached on (571) 272-4956. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Ruth S. Smith/
Primary Examiner, Art Unit 3737

EW